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Direct evidence of two superconducting gaps in FeSe0.5Te0.5: SnS-Andreev spectroscopy and the lower critical field

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Abstract

© 2016, Pleiades Publishing, Inc.We present direct measurements of the superconducting order parameter in nearly optimal FeSe Te single crystals with the critical temperature TC ≈ 14 K. Using the intrinsic multiple Andreev reflection effect (IMARE) spectroscopy and measurements of the lower critical field, we directly determined two superconducting gaps, ΔL ≈ 3.3−3.4 meV and ΔS ≈ 1 meV, and their temperature dependences. We show that a twoband model fits well the experimental data. The estimated electron–boson coupling constants indicate a strong intraband and a moderate interband interaction.

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